# A COMPARITIVE STUDY ON EFFECTIVENESS OF DIAPHRAGMATIC WITH COSTAL BREATHING EXERCISES ON IMPROVING PEFR AND DYSPNEA LEVEL ON ASTHMA PATIENTS

**Dissertation submitted to**

**THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY,**

**Chennai-32**

**towards partial fulfillment of the requirements of**

**MASTER OF PHYSIOTHERAPY**

**Degree programme**

**Submitted by**

**Reg no: 27092327**

**P.P.G. COLLEGE OF PHYSIOTHERAPY**

**9/1, Keeranatham road,**

**Saravanampatti,**

**Coimbatore-641035**

**www.ppgphysiotherapy.ac.in**

**P.P.G. COLLEGE OF PHYSIOTHERAPY**

**9/1, Keeranatham Road,**

**Saravanampatti,**

**Coimbatore- 641035.**

**The Dissertation entitled**

# "EFFECTIVENESS OF DIAPHRAGMATIC WITH COSTAL BREATHING EXERCISES ON IMPROVING PEFR AND DYSPNEA LEVEL ON ASTHMA PATIENTS"

**Submitted by**

**Reg no: 27092327**

**Under the guidance of**

**Prof .K. Raja Senthil. M.P.T (cardio-resp).MIAP, PhD**

**Principal**

**Dissertation submitted to**

**THE TAMILNADU DR. M. G. R. MEDICAL UNIVERSITY,**

**CHENNAI – 32.**

Dissertation evaluated on ----------

Internal Examiner External Examiner

# CERTIFICATE

This is to certify that the Dissertation entitled **"EFFECTIVENESS OF DIAPHRAGMATIC WITH COSTAL BREATHING EXERCISES ON IMPROVING PEFR AND DYSPNEA LEVEL ON ASTHMA PATIENTS"** was carried out by **Reg. no.27092323** P.P.G College of physiotherapy, Coimbatore-35, affiliated to The Tamilnadu Dr. M.G.R medical university, Chennai-32, under my guidance.

**Prof. K. RAJASENTHIL M.P.T (Cardio-Resp)., MIAP, PhD,**
**Principal**

# ACKNOWLEDGEMENT

Almighty is my **SAVIOR** with his grace I completed this project successfully.

I am very much grateful to my **LOVING PARENTS, WIFE & DAUGHTER** and family members for their personal interest, prayers and encouragement given throughout the arduous effort of my project.

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I extend my heartfelt gratitude to my PG coordinator **Prof. MANOJ ABRAHAM, Associate Prof. N.UMA M.P.T (Neuro), Assistant Prof. A.K.THARICK M.P.T(Cardio-Resp)** and all Physiotherapy Faculty members**.**

Last but not the least my gratefulness to the **PATIENTS** for their co-operation in making the study possible.

# ABSTRACT

## OBJECTIVES:

To find out the effectiveness of diaphragmatic breathing with costal breathing exercises on Asthma patients.

## DESIGN :

The study design was pre-test, post test experimental study design.

## PARTICIPANTS:

Sixty subjects aged 30 to 55 years with Asthma patients were selected under purposive sampling technique and assigned into two groups with 30 subjects each, one group remained as control group and other group received diaphragmatic breathing with costal breathing exercises.

## INTERVENTIONS:

The patients were instructed to perform diaphragmatic breathing with coastal exercises, four times each, three times a day for four weeks.

## MAIN OUT COME MEASURES:

PEFR on Peak Flow Meter and dyspnea rating on Modified Borg Dyspnea scale were used for evaluation of both groups.

## RESULTS:

Patients in the experimental group with diaphragmatic breathing and costal breathing exercises showed significantly better performance.

## CONCLUSION:

Results suggest that DBE with CBE improve the peak expiratory flow rate and reduce dyspnea level in Asthma Patients.

**KEY WORDS**

| | | |
|---|---|---|
| PEFR | - | Peak Expiratory Flow rate |
| DBE | - | Diaphragmatic Breathing Exercise |
| CBE | - | Costal Breathing Exercise |
| MBDS | - | Modified Borg Dyspnea Scale |

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# CHAPTER I

## 1.1 INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) according to World Health Organization (WHO) is a group of diseases that includes chronic bronchitis, Emphysema and Asthma. Exacerbations of COPD account for 10% of hospital admissions in the UK and with around 30,000 deaths per year; it represents the sixth most common cause of death in the UK.

In 1997, on the prevalence of smoking among men in Chennai, showed that the highest rate of tobacco consumption 64% was consumed by the uneducated people and by 2020, it may cause the third most important cause of death world wide.

Asthma is a leading cause of morbidity and mortality .The World Health Organization (WHO) estimated that obstructive diseases causes 4 -7 million death annually and this is the fifth leading cause of global mortality About 18 million Indians 5 percent men and 2.75 percent women above 30 years of age are already suffering from this disease.

Asthma is a chronic inflammatory disorder of airways in which cell many cells an cellular elements play a role (National Institute of Health 1997). It is a disease of diffuse airway inflammation caused by a variety of triggering stimuli resulting in partially or completely reversible broncho constriction, symptoms and signs include dyspnea, chest tightness, cough and wheezing.

Dyspnea is common in asthma patients due to obstruction of airways resulting in decreased lung function. Patho physiology includes broncho constriction, airways edema and inflammation airway hyper activity and airway remodeling.

Aim of physiotherapy is mainly to improve the lung function, to improve the peak expiratory flow rate and to reduce the dyspnea level.

According to Carlos P.Zalaquett, Lic, MA Ph. D [©1994- 2004] –it is hypothesized that breathing exercises helps in reduction of symptoms in patients with asthma.

Recent Advanced Studies Shows that Diaphragmatic with costal breathing exercise is now considered to be a mainstay of treatment for patients with Asthma. It has been shown to result in many benefits, including improvement in peak expiratory flow rate, reduction of dyspnea, improvement in health-related quality of life and reduction in Health-care utilization (Ries et al 1995; American college of chest Physicians 1997; American Thoracic society 1999; verrill et al 2005).

## 1.2 NEED FOR THE STUDY

The most common chronic lung diseases, COPD affects an estimated 17 million, and its incidence is rising.

About 18 million Indians 5 percent men and 2.75 percent women above 30 years of age Asthma is a leading cause of morbidity and mortality. Asthma tends to worsen with time.

Dyspnea is one of the major problems among the asthma patients. The on going difficulties met in asthmatic patients in their respiratory pattern needed to be recovered.

Diaphragmatic Breathing with costal Breathing exercise was developed to improve the peak expiratory flow rate and reduce the dyspnea level.

Combined diaphragmatic breathing with costal breathing exercise still remains to be optimized and lacks the much needed standardization. Hence the study aims in contributing towards this technique on Asthma Patients. Since there are less reports that have investigated the efficacy of DBE with CBE in Patients with Asthma. In the present study, the efficacy of Combined DBE with CBE in patients with Asthma has been investigated.

The importance of diaphr*agmati*c breathing with costal breathing exercise has been evaluated in this research. So there is a need to find out the importance of diaphragmatic breathing exercises on improving PEFR and dyspnea Level on Asthma Patients.

## 1.3 OPERATIONAL DEFINITIONS

**Asthma:**

A respiratory disorder characterized by recurring episodes of paroxysmal dyspnea, wheezing on expiration and or inspiration caused by constriction of the bronchi, coughing, viscous mucoid bronchial secretion.

**Mosby (2009)**

**Peak Expiratory flow Rate:**

Peak Expiratory flow rate is the measurement of the amount of air that leaves the lungs on forced exhalation.

**Mc Graw Hill (2003)**

**Peak Expiratory Flow Meter:**

It is a Portable in expensive hand held device used to measure how air flows from your lungs in one fast blast.

**European respiratory society**

**Diaphragmatic breathing or costal breathing**:

It is the act of breathing deep into ones lungs by flexing one's diaphragm. It is marked by expansion of the abdomen when breathing and is considered a healthier & fuller way to ingest oxygen.

**Wikipedia**

**Modified Borg Dyspnea Scale**

A system for scoring the perception of dyspnea, consisting of a liner scale ranking the degree of difficult in breathing, ranging from none to maximum -10.

**Chest Medicine**

## 1.4 AIM OF THE STUDY

Traditional Physiotherapy aims of the study is to find the efficacy of diaphragmatic breathing with costal breathing exercises proposed as a possible form of rehabilitation for patients with Asthma.

## 1.5 OBJECTIVE OF THE STUDY

The study aims to evaluate the effect of diaphragmatic breathing with costal breathing exercises by

- Improving the peak expiratory flow rate
- Decreasing dyspnea level.

## 1.6 HYPOTHESIS

**Null Hypothesis:**

"There is no significant difference in the symptomatic recovery on using diaphragmatic breathing with costal breathing exercises in patients with asthma"

**Alternative Hypothesis:**

"There is significant difference in symptomatic recovery on using diaphragmatic breathing with costal breathing exercises in patients with asthma"

## CHAPTER II

## REVIEW OF LITERATURE

.

1. **Prior etal(1979); Wilson etal (1995);**

   Described that active cycle of breathing control, thoracic expansion exercises and forced expiratory technique have been shown to be effective in the clearance of bronchial secretions, and to improve lung function.

2. **Casiari RJ (1981) Machid K(1999);**

   Evaluated the effects of breathing exercise. In this study they concluded that exercise tolerance and endurance in chronic obstructive pulmonary disease (COPD) patients has been improved.

3. **Gibbs RA, Seal RME; 1982**

   The study exhibited the relation of breathing retraining and relief of dyspnea increased exercise capacity and improved health related quality of life.

4. **Lennox S, Mengest PM, Martin JG, Am Rev Respir Dis(1985)**

   Found that combined diaphragmatic with costal breathing exercises improve the peak expiratory flow rate on asthma patients.

5. **Hill AR, J Assoc Acad Minor Phys,(1991)**

   Diaphragmatic with costal breathing exercises improves breathlessness and chest expansion.

6. **Park SS, SteinL , Zelefsky MN(1993)**

   Costal breathing with diaphragmatic breathing exercises can improve VC, reduce severity of asthma attacks and improves the pulmonary function.

7. **Manthous CA, Goulding P, chest(1997)**

Diaphragmatic breathing with costal breathing exercises resulted in thousands of asthma suffers reducing their medication in take.

8. **Joshi LN (1998)**

Found an increase in peak expiratory flow rate after breathing retraining programme.

9. **Herman HL(1998) Muller et al (1970), Uvalde (2000) Baic (1991);**

Found significant improve in forced Expiratory volume in one second after use of diaphragmatic breathing with costal breathing exercises.

10. **San Diego et al (2000)**

The Modified Borg's scale is a valid and reliable assessment tool for dyspnea. This study demonstrated that is correlated will with other clinical parameters and could be useful when assessing and monitoring outcomes in patients with asthma.

11. **Riera 2001**

All the Patients involved with the study exhibited a moderate to severe obstructive component. The experimental group demonstrated decreased perception of dyspnea and improved exercise capacity.

12. **Enright- 2004;**

Patients with mild asthma with high consumption of Beta agonist Studied to evaluate the effect of breathing retraining programme.

13. **Chan M,** Sitaraman **S, Dosanjh A, J Asthma; (2009)**

Breathing retraining programme changes the peak expiratory flow rate and oxygen saturation.

**14. Corry DB, Kheradmand f; (2009)**

The study conclusively showed diaphragmatic breathing with costal breathing exercises has been used to decrease the severity of breathlessness and improve exercise tolerance in patients with asthma.

**15. Al.-Shairk et al (2009)**

Conclude that Borg's scale rate of perceived exertion provides a simple and valid measurement of total and dimensional breathlessness in patients with asthma.

**16. Erwin CG et al**

The detection of airflow limitation in patients can be accomplished with variety of techniques. The most common include measurements of peak expiratory flow.

**17. Noble Betal**

Patients with pulmonary diseases can use a scale for rating perceived shortness of breath. a variation of the Modified Borg scale for rating of perceived exertion to prescribe exercise intensity.

**18. Miller et al**

Peak expiratory flow is the highest flow achieved from a maximum forced expiratory maneuver started without hesitation from a position of maximum lung inflation.

# CHAPTER III

# MATERIAL AND METHODOLOGY

## 3.1 MATERIAL

- Table
- Chair
- Couch
- Pillows
- Stop watch
- Stethoscope

## 3.2 METHODOLOGY

### 3.2.1 Study Design

Two group study designed with pretest and post test

### 3.2.2 Sampling technique

Purposive sampling technique

### 3.2.3 Sample size

60 subjects who fulfilled inclusion and exclusion criteria were selected for study.

### 3.2.4 Study method

Subjects were divided into Control group and Experimental group.

**CONTROL GROUP:**

30 Subjects were given no treatment and remained as control group.

**EXPERIMENTAL GROUP**

30 Subjects were treated with diaphragmatic breathing with costal breathing exercise program.

### 3.2.5 Selection Criteria

**Inclusion Criteria**

- Age : 30 to 55 Years
- Sex : Both Male and Female
- Patients under medication
- Chronic case of asthma patients are selected
- Breathlessness patients are only selected
- Patients physically and mentally fit for therapeutic programme.

**Exclusion Criteria**

- Chronic lung disease patient like tuberculosis carcinoma of lung.
- Cardio vascular diseases such as hypertension.
- Un co-operative patients
- Child hood asthma
- Acute Asthma.
- According to modified Borg scale very severe breathlessness, very severe and maximum breathlessness, and patients.
- Musculo skeletal disorder.
- Uncontrolled metabolic disease

### 3.2.6 Study setting

Study was conducted at

- ASHWIN MULTISPECALITY HOSPITAL
- KOVAI RESPIRATORY CARE CENTRE , Coimbatore

### 3.2.7 Study Duration

The study was conducted for duration of 5 months

### 3.2.8 Parameters

Peak expiratory Flow Rate –Peak Flow meter

Dyspnea rating –Modified Borg Dyspnea Scale

### 3.2.9 Treatment Technique

**CONTROL GROUP**

No treatment

**EXPERIMENTAL GROUP**

Diaphragmatic breathing with costal breathing exercise was designed to reeducate diaphragm, decrease the work of breathing by slowing breathing rate, decrease oxygen demand and use less effort and energy to breathe.

The following techniques have been used routinely by experimental group

**Diaphragmatic Breathing Exercise**

| | |
|---|---|
| Position of patient | : Half lying or sitting |
| Hand Placement | : Initially by the physiotherapist and then by the patient over the epigastric region. |
| Instructions | : Given to patients to take deep inspiration for three to five seconds, and then by holding the inspired air for 2 seconds, then relaxed expiration is taken with patient's own duration. |

**Costal Breathing Exercise**

| | |
|---|---|
| Position of patient | : Half lying or sitting |
| Hand Placement | : Placed on costal region and resistance is given with hand, during inspiration. |
| Instructions | : Given to patients to take deep inspiration for three to five seconds and then by holding the inspired air for 2 seconds. Then relaxed expiration is taken with the patient's own duration. |

### 3.2.10 STATISTICAL TOOLS

Pre test and Post test values of the study were collected and assessed for variations in improvements and their results are analyzed using in dependent‘t’ test

$$t = \frac{\overline{x}_1 - \overline{x}_2}{s}\sqrt{\frac{n_1 n_2}{(n_1 + n_2)}}$$

$$s = \sqrt{\frac{\sum d_1^2 + \sum d_2^2}{n_1 + n_2 - 2}}$$

Where s = combined standard deviation

$d_1$ and $d_2$ = different between initial and final reading in control group and experimental group respectively.

n1= No of patients in control Group

n2 = No of patients in experimental group

$\overline{X}1$ and $\overline{X}2$ = Mean of control group and experiments group respectively.

**Intra Group Analysis**

Paired”t’ Test

Statistical analysis is done by using dependent‘t’ test

$$t = \frac{\bar{d}\sqrt{n}}{s}$$

$$s = \sqrt{\frac{\sum d^2 - \frac{\left[\sum d\right]^2}{n}}{n-1}}$$

d = different between pre test Vs post test

d = Mean difference

n = Number of observations

s = Standard deviation.

### 3.2.11 Procedure

The subjects of both control group and experimental group were involved for pre test and post test, peak expiratory flow rate assessment by peak flow meter and dyspnea assessment by modified Borg's Dyspnea Scale.

The subjects of control group were given no treatment and experimental group were given diaphragmatic breathing with costal breathing exercises.

The patients were instructed to perform diaphragmatic breathing with costal breathing exercises 20 times per day for 4 weeks. Rest periods were given if experiencing severe dyspnea or any other limiting discomfort.

# CHAPTER - IV

# DATA PRESENTATION

**Table I**

**Pre- Test and Post -Test Values of control group using PEFM**

| S.NO | PRE- TEST | POST- TEST |
|---|---|---|
| **1** | 230 | 235 |
| **2** | 180 | 180 |
| **3** | 175 | 175 |
| **4** | 290 | 300 |
| **5** | 305 | 295 |
| **6** | 190 | 190 |
| **7** | 210 | 200 |
| **8** | 290 | 240 |
| **9** | 315 | 300 |
| **10** | 170 | 170 |
| **11** | 325 | 310 |
| **12** | 305 | 305 |
| **13** | 180 | 160 |
| **14** | 230 | 210 |
| **15** | 175 | 170 |
| **16** | 210 | 200 |
| **17** | 270 | 280 |
| **18** | 200 | 180 |
| **19** | 250 | 190 |
| **20** | 170 | 190 |
| **21** | 210 | 210 |
| **22** | 325 | 320 |
| **23** | 295 | 240 |
| **24** | 305 | 295 |
| **25** | 180 | 180 |
| **26** | 220 | 170 |
| **27** | 210 | 180 |
| **28** | 315 | 315 |
| **29** | 290 | 270 |
| **30** | 170 | 170 |

**Table II**

**Pre test and post test values of Experimental groups using PEFM**

| S.NO | PRE- TEST | POST- TEST |
|---|---|---|
| 1 | 200 | 330 |
| 2 | 05 | 325 |
| 3 | 310 | 340 |
| 4 | 230 | 300 |
| 5 | 180 | 220 |
| 6 | 295 | 305 |
| 7 | 310 | 340 |
| 8 | 325 | 350 |
| 9 | 210 | 315 |
| 10 | 220 | 295 |
| 11 | 190 | 300 |
| 12 | 305 | 340 |
| 13 | 295 | 320 |
| 14 | 325 | 340 |
| 15 | 305 | 360 |
| 16 | 220 | 295 |
| 17 | 230 | 300 |
| 18 | 210 | 340 |
| 19 | 180 | 300 |
| 20 | 175 | 290 |
| 21 | 210 | 300 |
| 22 | 200 | 315 |
| 23 | 315 | 340 |
| 24 | 230 | 300 |
| 25 | 170 | 230 |
| 26 | 290 | 360 |
| 27 | 170 | 295 |
| 28 | 210 | 315 |
| 29 | 200 | 295 |
| 30 | 250 | 360 |

**Table III**

**Pre- Test and post-test Values of control group using MBS**

| S.NO | PRE- TEST | POST- TEST |
|---|---|---|
| 1 | 4 | 4 |
| 2 | 3 | 3 |
| 3 | 5 | 5 |
| 4 | 3 | 4 |
| 5 | 4 | 5 |
| 6 | 4 | 4 |
| 7 | 3 | 3 |
| 8 | 5 | 5 |
| 9 | 4 | 5 |
| 10 | 4 | 4 |
| 11 | 5 | 4 |
| 12 | 4 | 4 |
| 13 | 5 | 5 |
| 14 | 3 | 4 |
| 15 | 3 | 4 |
| 16 | 5 | 5 |
| 17 | 3 | 2 |
| 18 | 4 | 5 |
| 19 | 3 | 5 |
| 20 | 4 | 4 |
| 21 | 4 | 5 |
| 22 | 5 | 5 |
| 23 | 3 | 3 |
| 24 | 4 | 4 |
| 25 | 5 | 5 |
| 26 | 4 | 5 |
| 27 | 5 | 4 |
| 28 | 3 | 3 |
| 29 | 3 | 5 |
| 30 | 4 | 5 |

**TABLE –IV**

**Pre- test and post-test values of experimental group using MBS**

| S.NO | PRE- TEST | POST- TEST |
|---|---|---|
| 1 | 4 | 2 |
| 2 | 3 | 2 |
| 3 | 5 | 3 |
| 4 | 4 | 3 |
| 5 | 3 | 2 |
| 6 | 5 | 3 |
| 7 | 4 | 2 |
| 8 | 5 | 3 |
| 9 | 3 | 2 |
| 10 | 5 | 2 |
| 11 | 4 | 3 |
| 12 | 5 | 2 |
| 13 | 4 | 2 |
| 14 | 4 | 3 |
| 15 | 5 | 2 |
| 16 | 3 | 2 |
| 17 | 4 | 3 |
| 18 | 4 | 2 |
| 19 | 3 | 2 |
| 20 | 5 | 4 |
| 21 | 3 | 2 |
| 22 | 4 | 3 |
| 23 | 4 | 2 |
| 24 | 5 | 2 |
| 25 | 4 | 3 |
| 26 | 5 | 4 |
| 27 | 3 | 2 |
| 28 | 3 | 2 |
| 29 | 4 | 3 |
| 30 | 5 | 3 |

## CHAPTER V

## DATA ANALYSIS AND INTERPRETATION

**Table V**

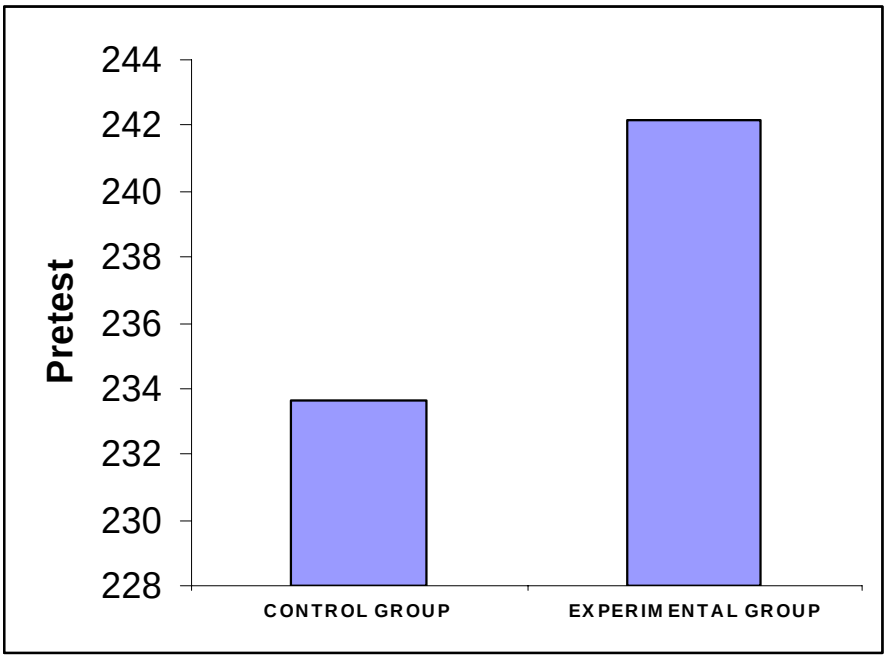
Analysis of pre test values of control group and experimental group using PEFM

| **TESTS** | **CONTROL GROUP** | **EXPERIMENTAL GROUP** |
|---|---|---|
| **Pre test Mean Value** | 233.67 | 242.2 |
| **Independent 't' test** | 0.6586 | |
| **P Value and its significance** | P Value is in significant | |

For 58 degrees of freedom at 5%level of significant, the calculated pre test 't' value between control group and experimental group was 0.6586 and the critical value was 1.960, Which states that there is no significant different between two groups.

## GRAPH I

## PRE-TEST VALUES OF CONTROL GROUP AND EXPERIMENTAL GROUP USING PEFM



## Table VI

Analysis of pre test values of control group and experimental group using MBS

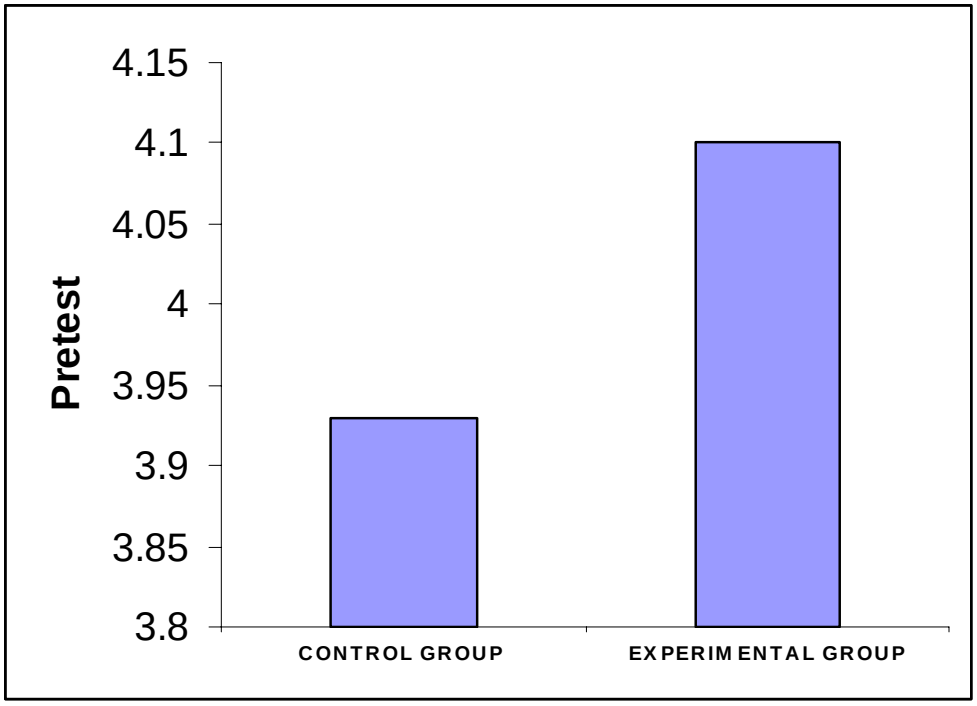
| TESTS | CONTROL GROUP | EXPERIMENTAL GROUP |
|---|---|---|
| **Pre test Mean Value** | 3.93 | 4.1 |
| **Independent 't' test** | 0.853 | |
| **P Value and its significance** | P Value is in significant | |

For 58 degrees of freedom at 5%level of significant, the calculated pre test 't' value between control group and experimental group was 0.853 and the critical value was 1.960, Which states that there is no significant different between two groups.

**GRAPH II**

**PRE-TEST VALUES OF CONTROL GROUP AND**

**EXPERIMENTAL GROUP USING PEFM**



## Table VII

Analysis of Post test values of control group and experimental group using PEFM

| TESTS | CONTROL GROUP | EXPERIMENTAL GROUP |
|---|---|---|
| **Post test Mean Value** | 271.67 | 227.67 |
| **Independent 't' test** | 3.292 | |
| **P Value and its significance** | P Value is significant | |

For 58 degrees of freedom at 5%level of significant, the calculated post test 't' value between control group and experimental group was 3.292 and the critical value was 1.960, Which states that there is significant different between two groups.

## GRAPH III

## POST-TEST VALUES OF CONTROL GROUP AND EXPERIMENTAL GROUP USING PEFM

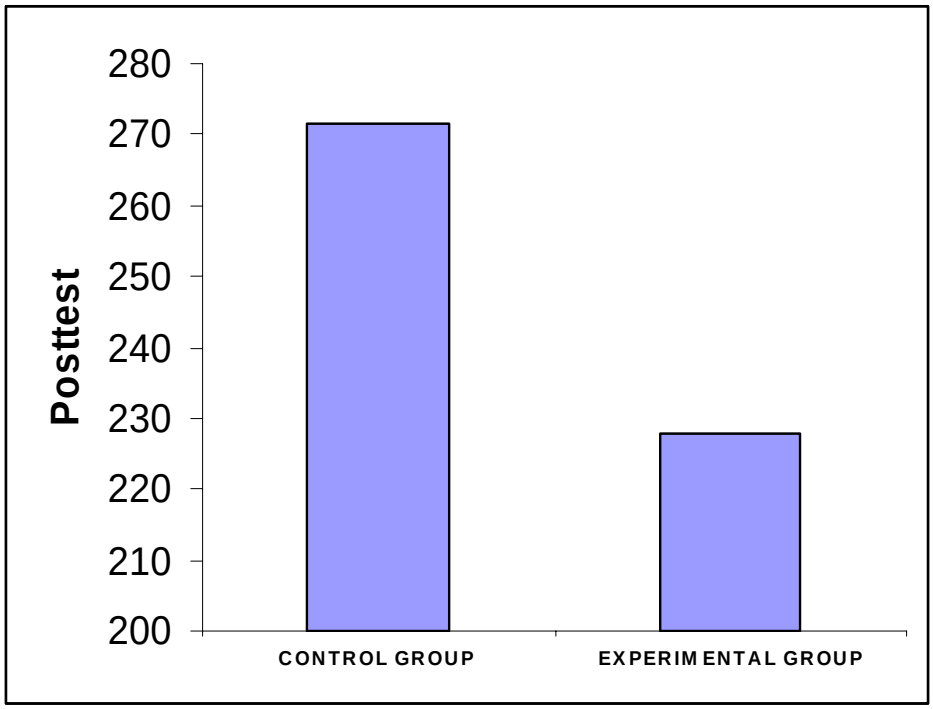


**Table VIII**

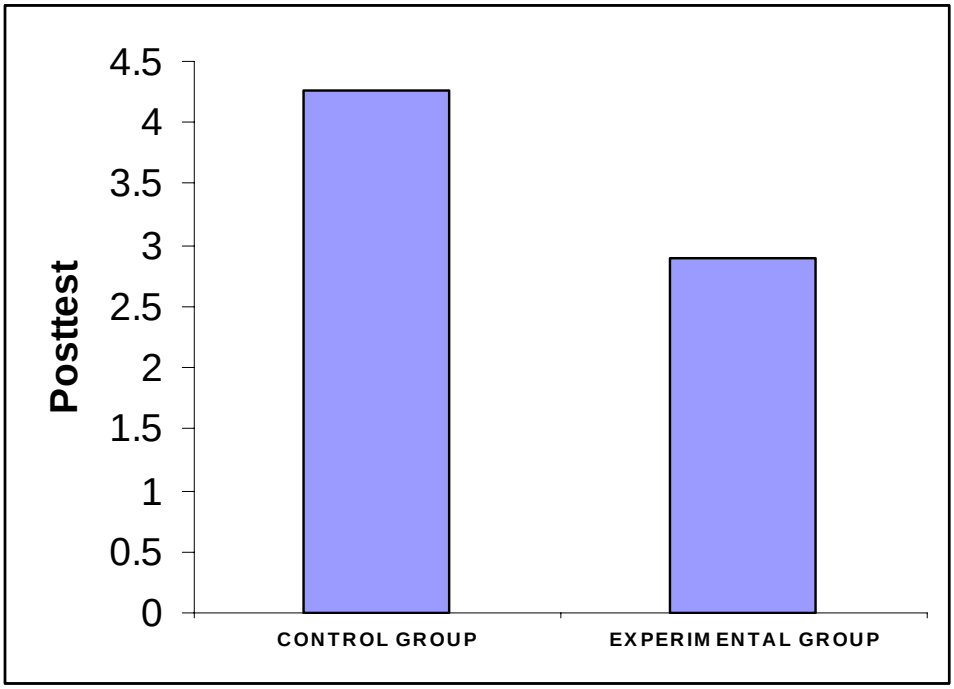
Analysis of post test values of control Group and experimental Group and using MBS

| TESTS | CONTROL GROUP | EXPERIMENTAL GROUP |
|---|---|---|
| **Post test Mean Value** | 4.27 | 2.9 |
| **Independent 't' test** | 5.473 | |
| **P Value and its significance** | P Value is significant | |

For 58 degrees of freedom at 5%level of significant, the calculated post test 't' value between control group and experimental group was 5.473 and the critical value was 1.960, Which states that there is significant different between two groups.

## GRAPH IV

## POST-TEST VALUES OF CONTROL GROUP AND EXPERIMENTAL GROUP USING MBS



## Table IX

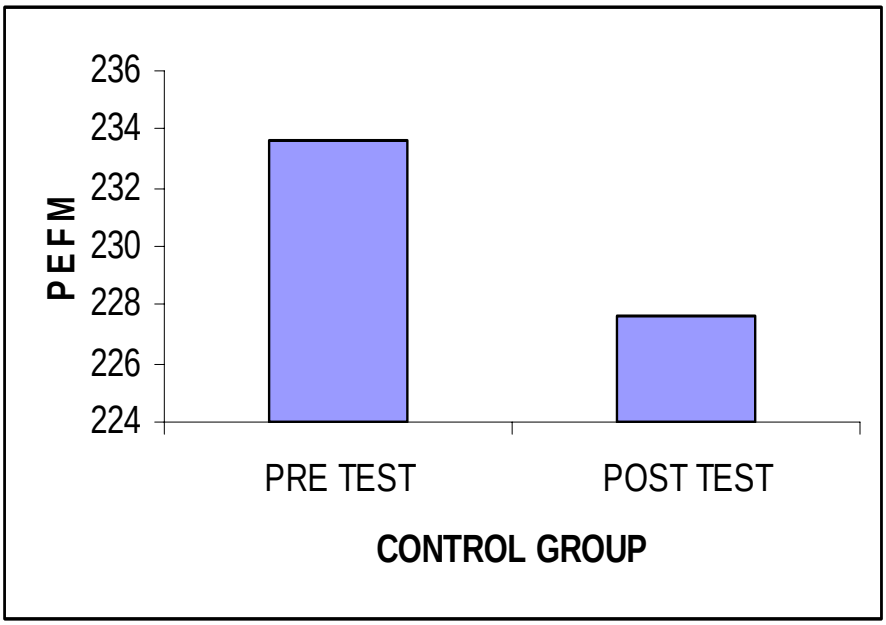
Analysis of pre test and post test values of control group using PEFM

| GROUPS | CONTROL GROUP | |
|---|---|---|
| | PRE TEST MEAN VALUE | POST TEST MEAN VALUE |
| **Control Group** | 233.67 | 227.67 |
| **Paired 't' test** | 0.44 | |
| **P Value and its significance** | P Value is significant | |

For 29 Degrees of freedom at 5 % level of significance, the calculated pre and posttest values of control group was 0.44 and the critical value was 2.045, which states that there is significant difference.

## GRAPH V

**PRE TEST AND POST TEST VALUES OF CONTROL GROUP USING PEFM**



## Table X

Analysis of pre test and post test values of control group using MBS

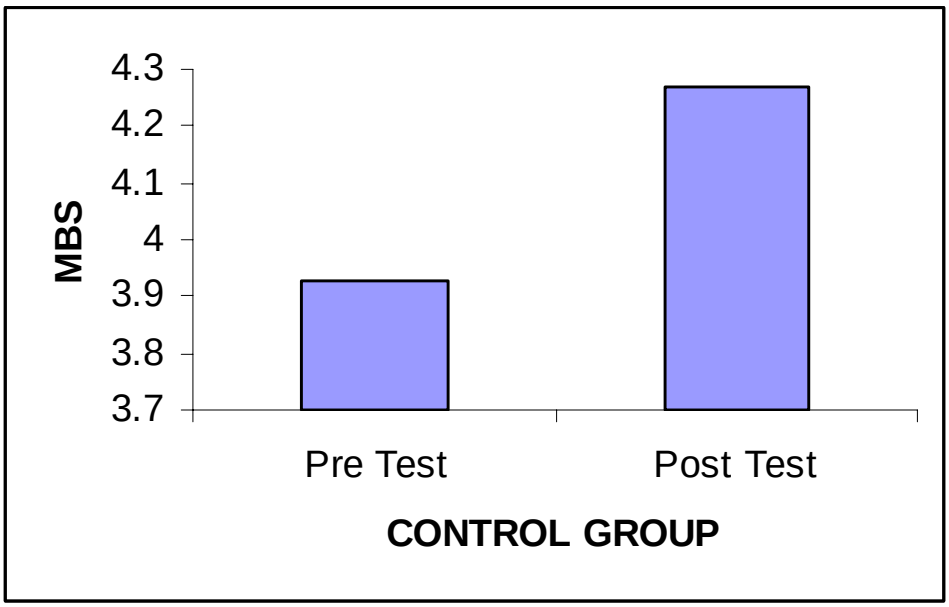
| GROUPS | CONTROL GROUP | |
|---|---|---|
| | PRE TEST MEAN VALUE | POST TEST MEAN VALUE |
| **Control Group** | 3.93 | 4.27 |
| **Paired 't' test** | 29.30 | |
| **P Value and its significance** | P Value is significant | |

For 29 Degrees of freedom at 5 % level of significance, the calculated pre and posttest values of control group was 29.30 and the critical value was 2.045, which states that there is significant difference.

**GRAPH VI**

**PRE TEST AND POST TEST VALUES OF CONTROL GROUP**

**USING MBS**



## Table XI

Analysis of pre test and post test values of experimental group using PEFM

| **GROUPS** | **EXPERIMENTAL GROUP** | |
|---|---|---|
| Experimental Group | **Pre test mean Value** | **Post test mean value** |
| | 242.2 | 271.67 |
| Paired ‘t’ test | 3.07 | |
| P Value and its significance | P Value is significant | |

For 29 Degrees of freedom at 5 % level of significance, the calculated pre and posttest values of Experimental group was 3.07 and the critical value was 2.045, which states that there is significant difference.

**GRAPH VII**

**PRE TEST AND POST TEST VALUES OF EXPERIMENTAL GROUP USING PEFM**

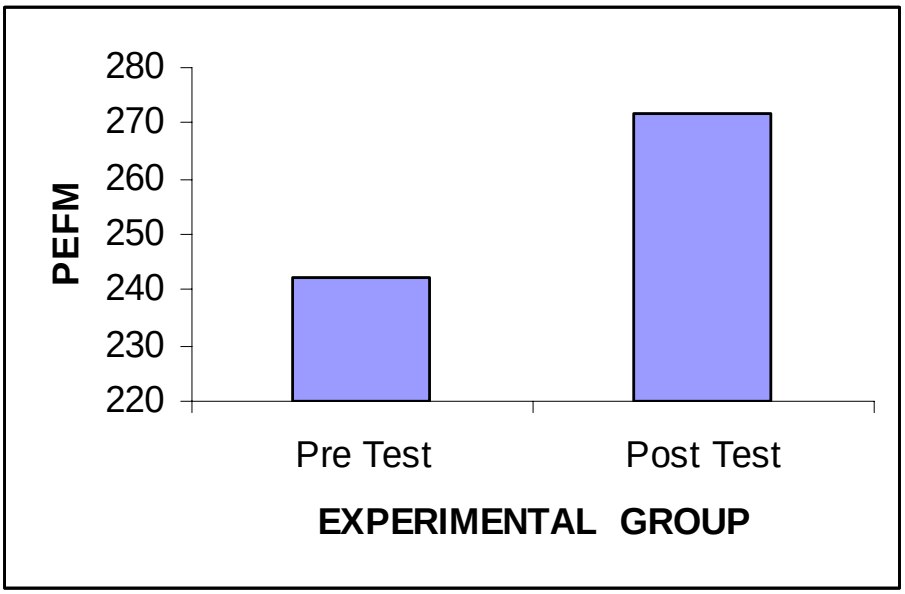


**Table XII**

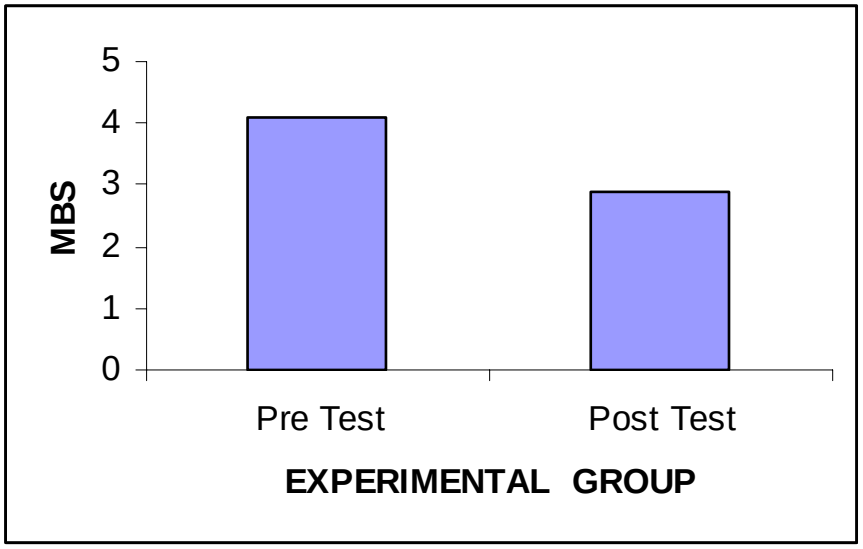
Analysis of pre test and post test values of experimental group using MBS

| **GROUPS** | **EXPERIMENTAL GROUP** | |
|---|---|---|
| Experimental Group | **Pre test mean Value** | **Post test mean value** |
| | 4.1 | 2.9 |
| Paired ‘t’ test | 4.916 | |
| P Value and its significance | P Value is significant | |

For 29 Degrees of freedom at 5 % level of significance, the calculated pre and posttest values of Experimental group was 4.916 and the critical value was 2.045, which states that there is significant difference.

**GRAPH VIII**

**PRE TEST AND POST TEST VALUES OF EXPERIMENTAL GROUP USING MBS**



# CHAPTER VI

## RESULTS

While comparing the post test values of control group and experimental group using independent 't' test the calculated value is using PEFM is 3.292 and by using MBS is 5.473, Since the alternate hypothesis is accepted , Which shows there exists a significant different between the post test values of two groups.

When comparing the mean value of both, the post test mean values of both , the post test mean value of control group using PEFM is 227.67 and using MBS is 4.27 and experimental group using PEFM is 271.67 and using MBS is 4.27 and experimental group using PERM is 271.67 & using MBS is 2.9 is greater which confirms that experimental group shows a significant improvement in PEFM and significant improvement in PEFM and dyspnea level. In Confirms that experimental group shows a significant improvement in PEFR and dyspnea level. In an effect to find out the efficacy of diaphragmatic breathing with coastal breathing exercise in improving the peak expiratory flow rate And dyspnea level in Asthma Patients, 60 subjects were selected using purpose in sampling technique and assigned into control and experimental groups with 30 subjects each.

Control group were given no treatment and experimental group was treated with diaphragmatic breathing with coastal breathing exercises for a period for four weeks.

Pre –test and post-test scores are noted and analysis was done using independent't' test which favored the alternate hypothesis.

The intra group analysis was done and result were analysis using paired't' test, which favored alternate hypothesis.

Statistical analysis shows there is significant improvement in PEFR and dyspnea level in Asthma Patients in Experimental group (Diaphragmatic Breathing with Costal breathing Exercise)than in control group.

It can be concluded with statistical analysis that combination of diaphragmatic breathing with costal breathing exercises were found to have a vast improvement in the PEFR and dyspnea level of asthma Patients.

# CHAPTER VII

## DISCUSSION

COPD is the chronic respiratory disorder characterized by cough, dyspnea and restriction of function. The magnitude of problem requires that we develop a comprehensive and effective treatment for such a complex problem**. (Boyd et al 2005)**

A study by Lacasse et al 1996 asthma is a chronic inflammatory disorder of airways. In susceptible individuals inflammation results. These episodes of signs and symptoms are associated with wide spread but variables airflow obstruction that is often reversible either spontaneously or with treatment. Thus management of patients with asthma includes education, preventive care, pharmacological and oxygen therapy and pulmonary rehabilitation**.**

A recent study by Troosters et al 2005 pulmonary rehabilitation is a effective treatment option for asthma may improve exercise capacity, at least in part, by reducing systematic oxidative stress. Also dyspnea is consistently reported to be reduced after pulmonary rehabilitation which is supported by the study Gigliotti et al 2003**.** The reduction in dyspnea is mediated through the reduced ventilator requirements at identical work rates and identical oxygen consumption.

The main objective of physical therapy for asthma is dyspnea control and to improve the exercise capacity by optimizing muscle function and conditioning. These can be achieved from various techniques but more focus is towards attaining these objectives are diaphragmatic breathing with costal breathing exercise program, breathing re-training program.

Diaphragmatic breathing exercise with coastal breathing exercise will increase the peak expiratory flow rate and improve dyspnea level which is proved in this study and in past study by C J clark et al., 1996

Thus, we found that most of our patients represented and improvement in the PEFR and dyspnea level at the end of the rehabilitation program, this improvement may have been due to changes in ventilatory capacity and improve respiratory patterns. The PEFM and MBS have advantage of being has standardized questionnaire, allowing comparison between studies and different interventions and hence it may be helpful for future research studies.

# CHAPTER VIII

## SUMMARY AND CONCLUSION

### SUMMARY

This study was done with the aim of identifying the improvement in peak Expiratory flow rate and reducing dyspnea level on asthma patients using is diaphragmatic breathing exercise with costal breathing exercises. This study conducted with control and experimental group includes 60 patients ,30 in each group..pre and post test scores are recorded using PEFR and modified Borg scales.control group has no treatment and experimental has diaphragmatic breathing exercise with costal breathing exercises. the data's were analyzed thorough paired t test and independent t test and find out the level of significance.

The results of this study show statistically that the experimental group is more significant than control group.

### CONCLUSION

It can be concluded that the diaphragmatic Breathing with costal breathing Exercises is shows more significant improvement in peak expiratory flow rate and dyspnea level.

# CHAPTER IX

## LIMINATIONS AND SUGGESTIONS

This Study has been done with small sample size so further study can be done with large samples.

This study was very short term and therefore to make it more valid long term is necessary, variation in calamite, drugs, diet, personal habit, side of involvement gender, age could not be controlled.

Only diaphragmatic breathing with costal breathing exercise was considered in this study, further research can include other breathing exercise.

Same study can also be recommended on other pulmonary conditions

Though modified Borg's Dyspnea scale administration objectively bias is possible, further study can be done with other reliable assessment tools. Home exercise programme also can be recommended.

# CHAPTER - X

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# CHAPTER XI

## APPENDIX –I

## CASE ASSESMENT PROFORMA

CASE NO :

NAME :

AGE/SEX :

ADDRESS :

DATE OF ADMISSION :

DATE OF EVALUATION :

HISTORY :

ON OBSERVATION :

ON EXAMINATION :

TREATMENT :

MEASUREMENT TOOL : PEFM and Borg's Scale

| S.NO | PRE TEST | POST TEST |
|---|---|---|
| | | |
| | | |
| | | |

**Signature of Physical Therapy Student**

## APPENDIX –II

## INFORMED CONSENT FORM

**TITLE: "EFFECTIVENESS OF DIAPHRAGMATIC BREATHING WITH COSTAL BREATHING EXERCISE ON IMPROVING PEFR AND DYSPNEA LEVEL ON ASTHMA PATIENTS"**

**INVESTIGATOR:-**

**PURPOSE OF THE STUDY:**

I……., have been informed that this study will work towards achieving the normal rate of breathing and top reduced breathlessness in asthma for me other patients.

**PROCEDURE:**

Each term of the study protocol has been explained to me in detail. I understand that during the procedure, I will be receiving the treatment for three times a day. I understand that I will to take this treatment for four weeks.

I understand that this will be done under therapist's supervision. I am aware also that I have to follow therapist's instruction as has been told to me.

**CONFIDENTIALITY:**

I understand that medical information provided by this study will be confidential. if the data are used for publication in the medical literature are for teaching purpose, no names will be used and other literature such as audio or video tapes will be used only with permission.

**RISK AND DISCOMFORT**

I understand that there are no potential risks associated with this procedure, and understand that he will accompany me during this procedure. There are no known hazards associated with this procedure

**REFUSAL OR WITHDRAWL OF PARTICIPATION:**

I understand that the decision my participation is wholly voluntary and I may refuse participate, may withdraw consent at any time during the study.

I also understand that the investigator may terminate my participation in the study at any time after he has explained me the reasons to do so.

**I……..have explained……the purpose of the research, the procedure required and the possible risk and benefits , to the best of my ability**

**……..** **……..**

**Investigator** **Date**

**I…….. Confirm that …….has explained me the purpose of the research, the study procedure and the possible risks and benefits that I may experience. I have read and I have understood this consent to participate as a subject in this research project.**

| | |
|---|---|
| **……..** | **…….** |
| **Subject** | **Date** |
| **……..** | **……..** |
| **Signature of the witness** | **Date** |

# APPENDIX –III

## BORG'S SCALE(RATE OF PERCEIVED EXERTION)

| Scale | Severity |
|---|---|
| 0 | No Breathlessness |
| 0.5 | Very very slight (just Noticeable) |
| 1 | Very slight |
| 2 | Slight breathlessness |
| 3 | Moderate |
| 4 | Somewhat severe |
| 5 | Severe breathlessness |
| 6 | |
| 7 | Very severe breathlessness |
| 8 | |
| 9 | Very very severe (almost Maximum) |
| 10 | Maximum |

EXPLANATION TO THE PATIENTS:

PRE TEST :

POST TEST :